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Barnes

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(54) **REMOTE AGENT CAPTURE AND MONITORING**

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This patent is subject to a terminal disclaimer.

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H04N 5/77 (2006.01)
H04N 5/04 (2006.01)
G06Q 10/06 (2012.01)

(52) **U.S. Cl.**
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(58) **Field of Classification Search**

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USPC 386/223–224, 239–248, 228–229
See application file for complete search history.

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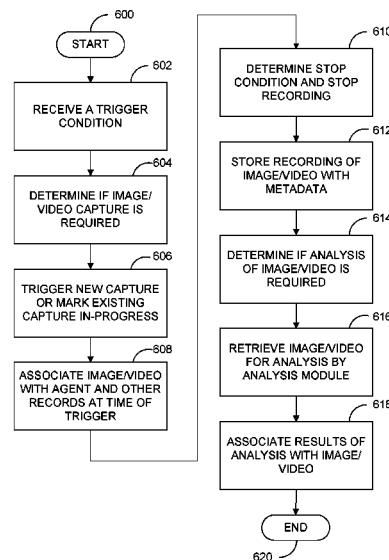
Primary Examiner — Hung Q Dang

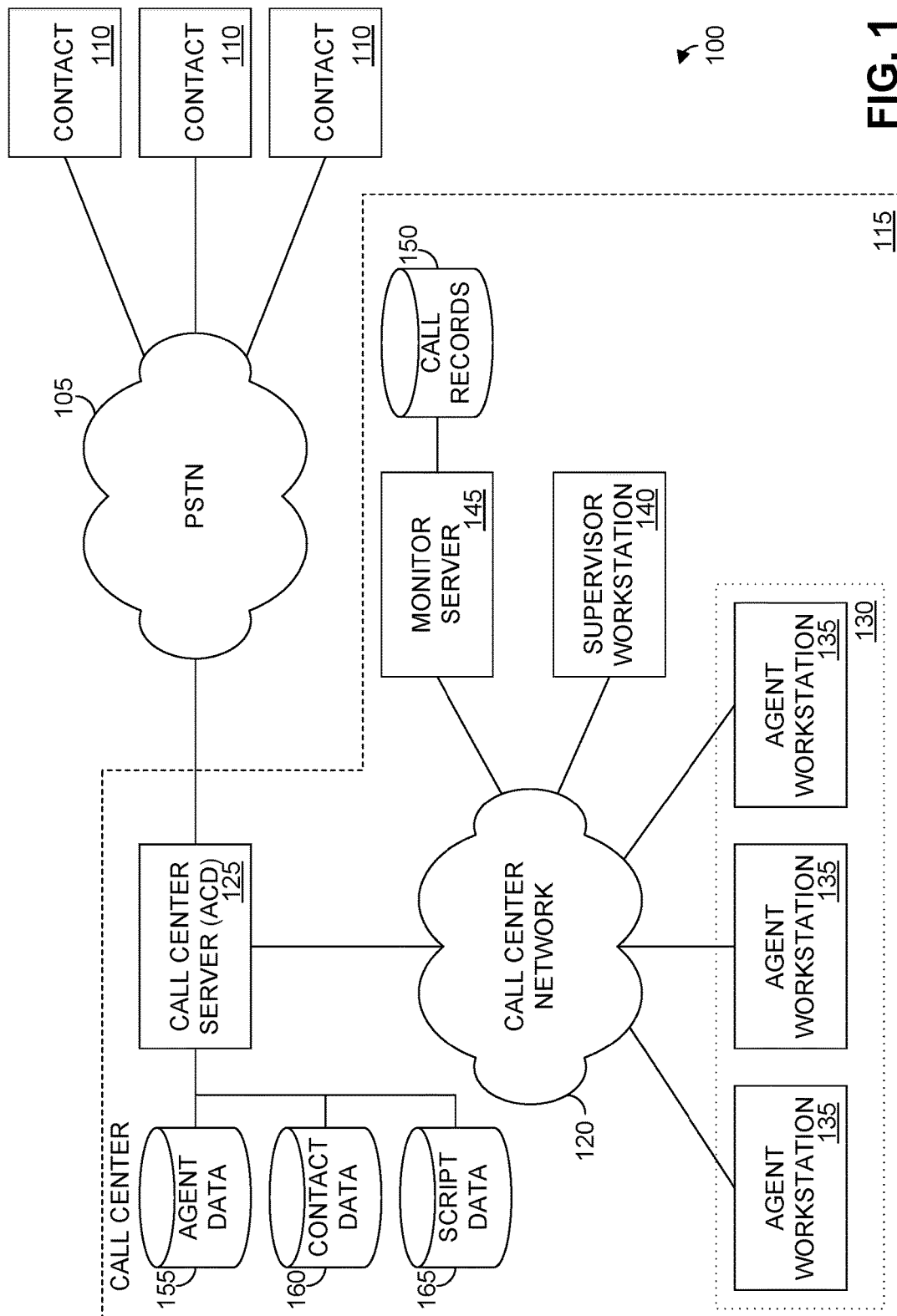
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(57) **ABSTRACT**

Methods and systems for monitoring a remote agent. An agent's workstation may be provided with an application that receives a trigger condition at an agent workstation during a communication between the remote agent and a caller. During the communication, it may be determined if video imagery of the remote agent is required. If so, video imagery capture may be triggered. The video imagery may be associated with activities of the remote agent during the capture, and the video imagery stored at a recorder for later playback.

20 Claims, 6 Drawing Sheets





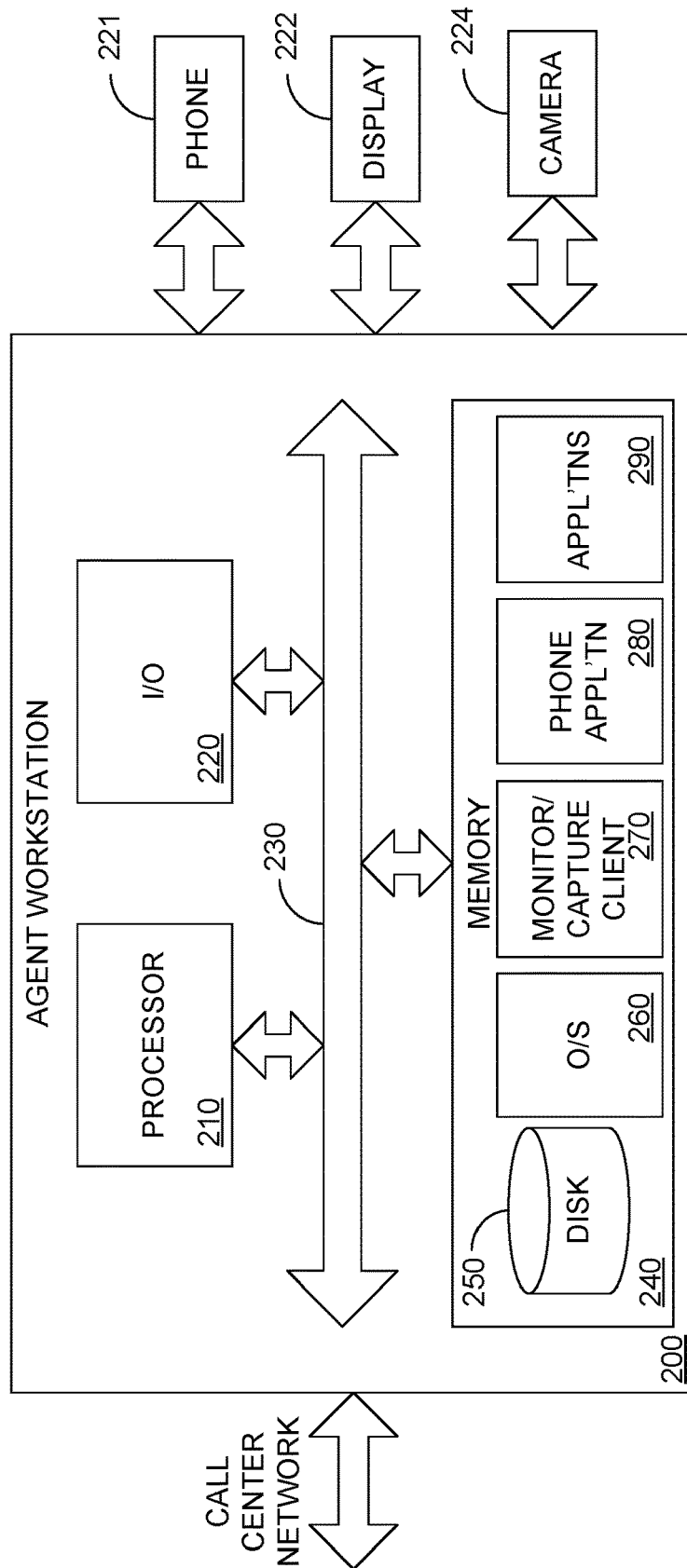


FIG. 2

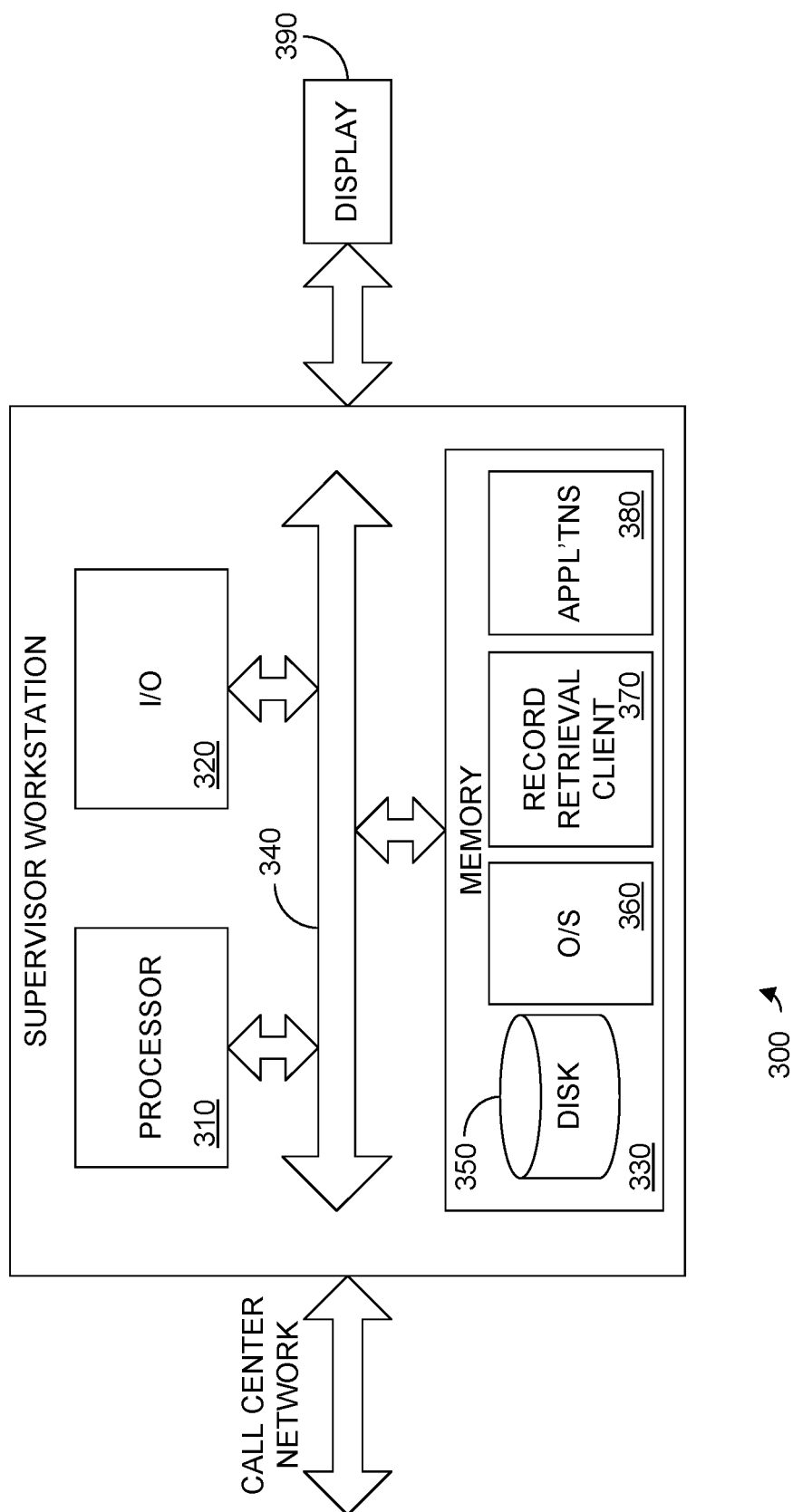


FIG. 3

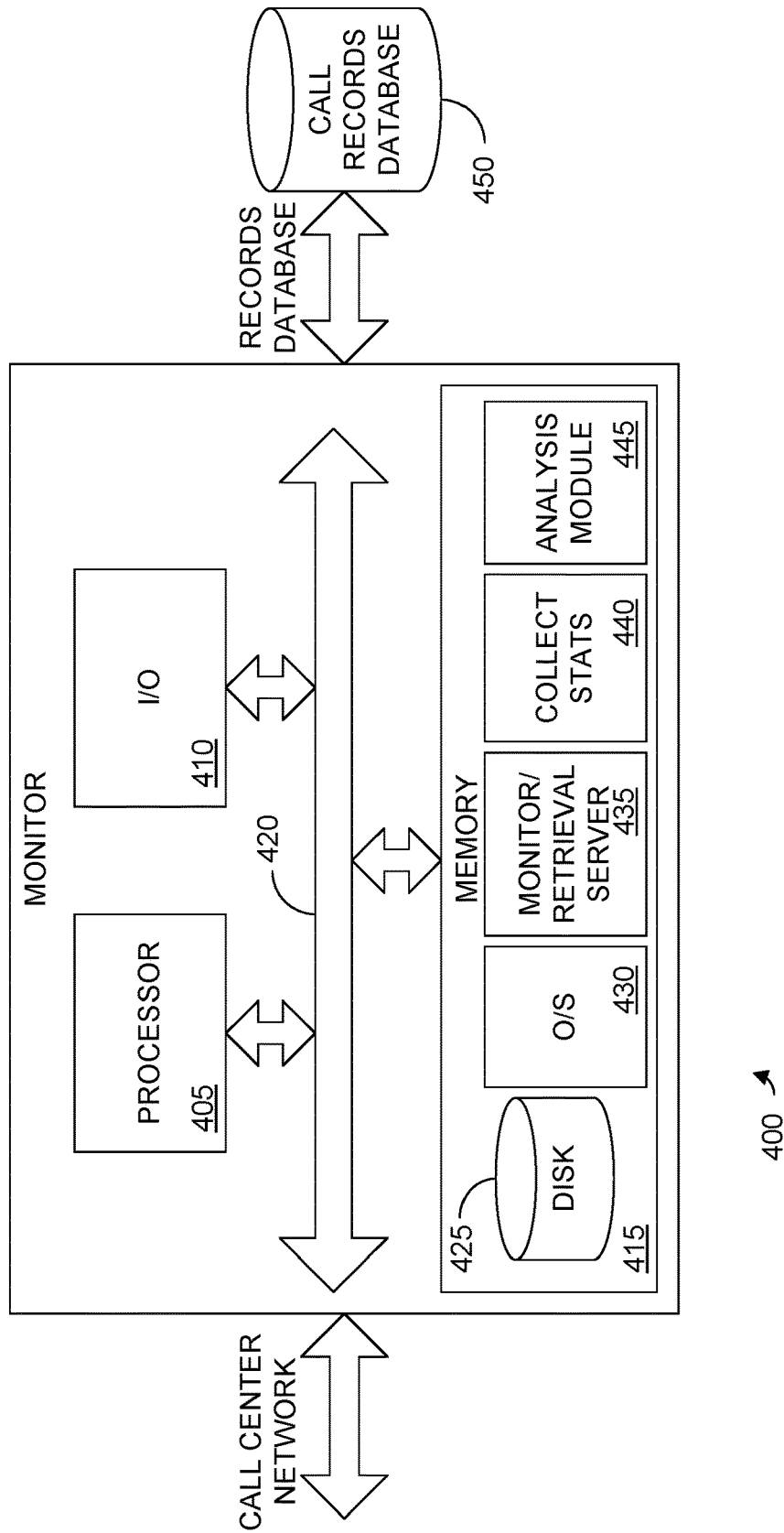
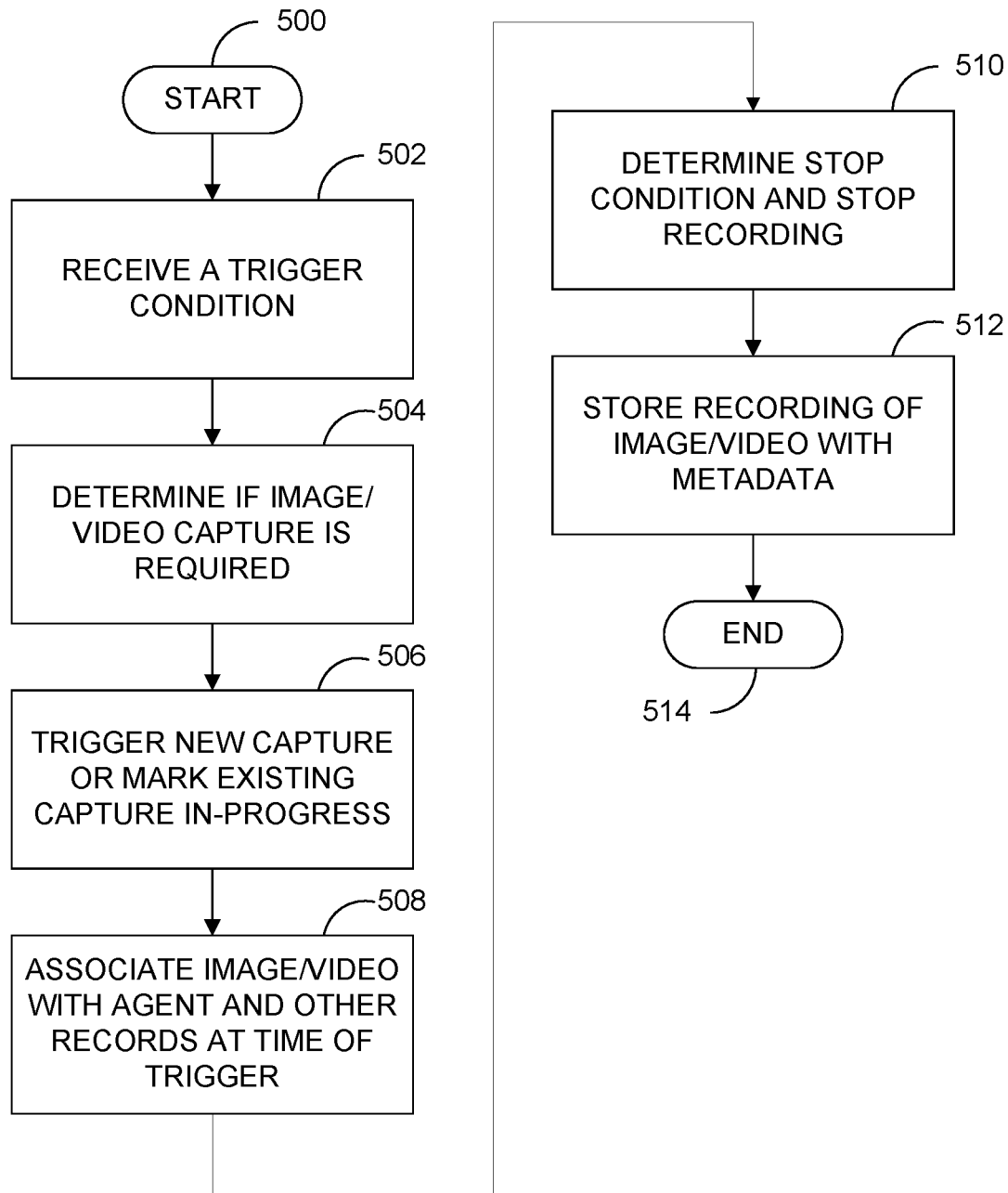
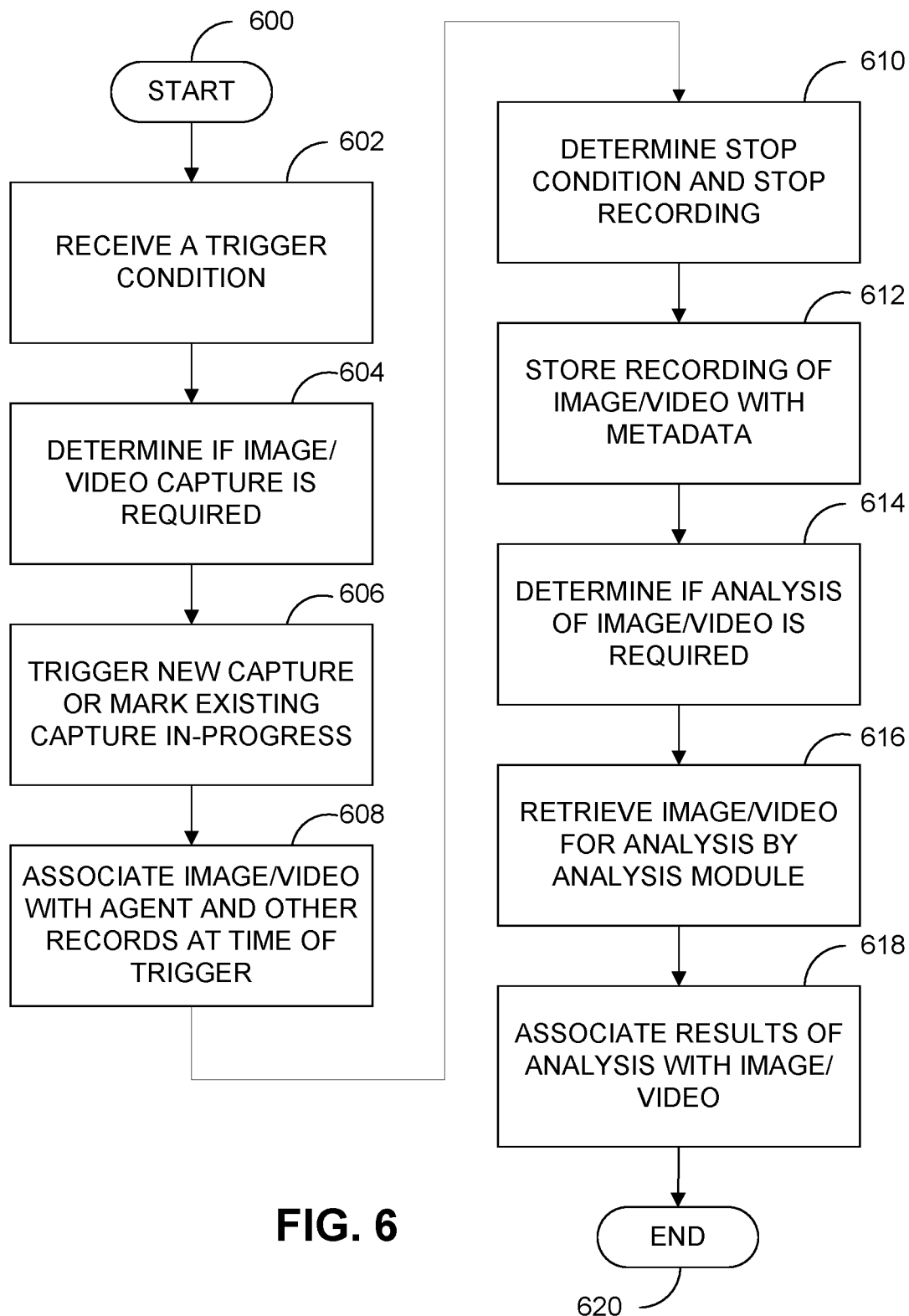


FIG. 4

**FIG. 5**

**FIG. 6**

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REMOTE AGENT CAPTURE AND MONITORING

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to U.S. patent application Ser. No. 12/914,991 which was filed Oct. 28, 2010, and entitled "Remote Agent Capture and Monitoring which claims priority to U.S. Patent Application No. 61/256,595, filed on Oct. 30, 2009, and entitled "Remote Agent Capture," which is incorporated by reference herein in its entirety.

BACKGROUND

This disclosure relates to computer-telephony integration systems and methods, and more particularly to systems and methods for voice and data recording and monitoring of a remote agent at a computer workstation.

In some business environments, computers are used in conjunction with telephones in order to provide services. For example, in providing credit card-related services, it is known to provide customer service representatives (hereinafter referred to as "agents" or "employees"), with access to a computer workstation as well as a telephone. Some of the agents may work remotely in locations away from a, e.g., contact center. In the process of providing telephonic service from the agent to the customer, a customer can contact the agent (or vice versa) through a telephone connection, and the customer and the agent will discuss matters relating to the customer's account over the telephone.

SUMMARY

In order to provide supervision of such agents, it is often desired to allow an agent's supervisor (hereinafter "supervisor"), with a way to monitor the activities of such agents during their telephone conversations together with video or still imagery of the agents themselves. Such monitoring of a "monitored workstation" may be considered quality control of the agent's services. For example, it is worthwhile for a supervisor to know if an agent is using his/her computer time efficiently (not moving back and forth from various screens or applications unnecessarily), or is rude or discourteous while on the telephone, or is in-fact the agent. Such information can be determined by having a supervisor "look over the shoulder" of an agent, viewing him/her, his/her computer activities, as well as viewing and listening to the telephone conversation.

Monitoring systems are disclosed herein that transparently monitor the agent(s) and send video imagery to a monitor server and/or a record for analysis and storage. These monitoring systems record the activities of the agent(s), making the records available for supervisor review, training, and provide an audit trail for transactions entered by the agent(s). Other features and advantages of the present disclosure will become apparent upon reading the following detailed description of the disclosure when taken in conjunction with the drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram illustrating an example environment where a complex recording trigger may be used.

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FIG. 2 is a block diagram illustrating an agent workstation including monitor and capture clients used to monitor and/or record activity occurring on the agent workstation.

FIG. 3 is a block diagram illustrating a supervisor workstation used to review agent activity.

FIG. 4 is a block diagram illustrating a monitor including a complex recording trigger.

FIG. 5 shows an operational scenario for monitoring an agent terminal.

FIG. 6 shows another operational scenario for monitoring an agent terminal.

DETAILED DESCRIPTION

Reference is now made to FIG. 1, which illustrates a configuration 100 according to the present disclosure. As shown, the configuration 100 includes a public switched telephone network (PSTN) 105, connecting a plurality of contacts 110 to an interaction center 115 (e.g., a call center). The call center 115 can include an internal voice/data network 120, to which is attached a server 125, a group 130 of monitored workstations 135 (e.g., agent workstations), a monitoring workstation 140 (e.g., supervisor workstation), and a monitor server 145. Networking between these elements may be done through TCP/IP protocols, although other network protocols may be used without departing from the scope of the present disclosure.

On-screen activities conducted at the monitored workstation 135 can be viewed (or "monitored") by the supervisor on the screen of the monitoring workstation 140 either in real time (i.e., as the activities are actually occurring), and/or the on-screen activities conducted at the monitored workstation 135 can be recorded by the monitor server 145 to a call records database 150 and "played back" at the monitoring workstation 140 at a later time. These activities may be played back much as one would play back the video tape of a television program, that is the on-screen and synchronized voice activities that occurred at the monitored workstation 135 may allowed to "play" at the monitoring workstation 140 substantially as they previously actually happened, portions may be replayed, the activities may be stopped or "paused" for particular review, and certain portions may be skipped if so desired.

It should be understood that the call center server 125 is configured to receive and route telephone calls received via the public switched telephone network 105 from contacts 110 to any of a number of agent workstations 135 via the internal call center network 120. The call center server 125 can perform the functions of an automatic call distribution system; for example, by retrieving contact data from the contact database 155 and analyzing agent data from an agent data database 160 to determine which of the agents working at the agent workstations 135 should receive an incoming call from a contact 110. Moreover, the call center server 125 can provide script data stored in a script data database 165 to the agent workstation to assist the agent in communicating with the contact. Where the call center is a technical assistance center for a product, the script could be a troubleshooting manual that gives the agent several possible problems and solutions for the symptoms specified by the contact. It should be noted, however, that the script could be implemented in many different ways, such as, for example, a web page. Moreover, the script could be stored on the agent workstation rather than the call center server.

The software on the monitor server 145 can be configured to send data polls to software installed and running on the agent workstation 135. It should be understood, however,

that the agent workstation **135** can be configured to provide the updates to the monitor without prompting from the monitor server **145**. The software on the agent workstation **135** can intercept workstation data, by "hooking" or "scraping." Hooking operates by capturing operating system graphics primitives relevant to actual screen display, and either returns selected screen portions (referred to as "changed regions") which have changed since the last data poll. The changed regions are displayable at a remote location in real time or can be recorded for display at a remote location at a later time. The technique is substantially "passive" in that it preferably does not perceptibly interfere with the operation of the agent's workstation, which would be a signal to the agent that he or she is being monitored.

As mentioned above, the monitor could also use a "scraping" technique. The "scraping" can occur in response to a poll. When the poll is received, the full screen is grabbed and compared (such as by an XOR operation) to a previously grabbed screen, and changed regions including the screen differences are sent over the network to the server. In one implementation, the first and last "differences" in the XOR comparison are determined, and all data therebetween is considered within the changed region, which is not necessarily rectangular. However, it should be recognized that the entire screen or portions of the screen could be sent over the network using either the "hooking" or "scraping" techniques, or the primitive graphics commands themselves, or any other technique operable communicate the agent's activities for recording may be sent in accordance with the present disclosure.

In order to provide consistent and acceptable service to contacts, systems can monitor both the "desktop" screen display and the telephonic habits of the agents, in order to properly train agents and to provide quality control of the agent's services. Moreover, the computer activities of the agent are synchronized with the telephone communication of the agent. Thus, a later viewer (e.g., the supervisor) could view the agent's activities and listen to the conversation substantially as it occurred in real time.

FIG. 2 is a block diagram of a monitored workstation **200** and includes hardware (processor **210**, I/O **220**, bus **230**, memory **240**, disk **250**, etc.) and software (operating system (O/S) **260**, monitor/capture client **270**, phone application **280**, and other applications **290**) mounted thereon. A telephone signal **221** may be routed through the workstation **200**, as shown. Such a configuration could help to facilitate the capture and synchronization of the display data **222** and the voice data **221**. However, it should be noted that a telephone signal could be provided independently from the agent's computer through the use of an independent telephone extension.

The hardware used can be personal computer (PC) hardware such as that used to operate OS/2 available from IBM Corporation of White Plains, N.Y., or Windows available from Microsoft Corporation of Redmond, Wash. However, it should be understood that different hardware configurations may be used without departing from the spirit and scope of the present disclosure.

The workstation **200** is loaded with and runs a graphics user interface such as, for example, OS/2 (indicated generally as **260** and defined by the dotted line). However, it should be noted that the scope of this disclosure is not limited to a particular operating system. For example, the teachings of the present disclosure can be applied to any number of operating systems, including, but not limited to, OS/2, Windows, Unix-type operating systems such as available from Sun Microsystems of Santa Clara, Calif., Linux

available from RedHat Corporation of Raleigh, N.C., Mac OS X available from Apple Computer, Inc. of Cupertino, Calif., among many others. As is known in the art, the OS/2 operating system **260** incorporates the use of a graphics engine (known as OS2GRE in OS/2 and GDI in Windows). Upon receiving an instruction from, for example, one of applications **290**, (example: "draw a window") the operating system will utilize its graphics engine to send a combination of typically smaller, more specific (i.e., low level) instructions by means of graphics primitives (e.g. "draw line", "bitblt" "draw wide border", "draw text", etc.) to a display driver associated with the particular video display hardware (e.g., I/O **220**) is being used within the monitored workstation.

As noted in more detail below, it is these graphics primitives that are interpreted under the present disclosure in order to define localized screen changes. Such screen changes can be due to "on screen typing" (as described in detail below), can be pursuant to manual or automatic user commands (open/close window), or can be other automatic screen changes, such as caused by a blinking cursor or an on-screen clock.

As may be understood, multiple applications **280**, **290** may be used by the agent on the workstation **200** to provide service to the customers. These applications can include myriad programs, such as, for example, a web browser, an online help manual, training programs, and scheduling programs, among many others. Because every application is drawing to its own virtual desktop, and is not aware of what the other applications are doing, the graphics engine responds to different requests from the applications, determining what requests should be visible to the end user, and sends those requests as a list of primitives to the video driver.

The general configuration and operation of the operating system **260** such as OS/2 is assumed to be known to one skilled in the art; however, the reference manual "OS/2 2.0 Technical Library—Presentation Driver Reference, Version 2.00", Published by IBM, First Edition, copyright 1992, and subsequent versions thereof, are incorporated herein by reference, including but not limited to the general operation of the OS/2 operating system, the function and operation of graphics primitives generally and individually, and dynamic link library functions (DLLs).

The capturing software generally consists of a capture module and a monitor module (e.g., monitor/capture client **270**). The operation of the monitor/capture modules is described in detail in U.S. patent application Ser. No. 10/118,848, entitled "Improved Method and Apparatus for Simultaneously Monitoring Computer User Screen and Telephone Activity from a Remote Location," which is hereby incorporated by reference in its entirety.

In addition, the agent workstation **135** may include a camera **224**. The camera **224** may provide a video/still image solution that may stream continuous video/pictures or be under control of another system within the monitor server **145**. The monitor server **145** will be able to record video/still images from any such agent workstation **135** and store them at, e.g., a call records database **450** (e.g., a recorder, see FIG. 4). For example, the agent workstation **135** may intercept an IP video stream, capture a screen on the agent workstation **135** that is displaying the video/image from the camera **224**, or through any other connection method suitable to allow the capture of the video or still picture of the agent and or agents locality. In some implementations, the capture of the video/still image from the camera **224** may be performed as the video/still image stream is transmitted to another system.

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Voice, screen or any other associated media/communication recording data may be associated with the agent by, e.g., tagging the data with agent ID included. The video/still picture capture may be controlled by the monitor server **145**, and the recorded video/still pictures may be associated to the agent by, e.g., tagging the data with an agent ID.

FIG. 3 shows a block diagram of the supervisor workstation. The supervisor workstation can include many of the same components as the agent workstation. The supervisor workstation can include hardware devices such as a processor **310**, I/O **320**, and memory **330**. Each of these hardware devices can communicate with each other via a bus **340**. The I/O **320** can include an input interface such as, for example, a keyboard, a mouse, or some other suitable device, an output display interface such as, for example, a monitor **390**, a printer, or data communications interface, among others. The memory **330** of the system can include a RAM, ROM, a hard drive, or other suitable storage mechanisms. Also stored in memory **330** can be a number of applications, each of the applications being enabled for execution on the processor **310**. In the current example, the memory includes an operating system **360**, a record retrieval client **370**, and other applications **380**.

The record retrieval client **370** can be configured to retrieve records from the call records database via the call center network after the monitor server has stored the call record. The records can be stored and searched according to parameters related to agent information, call information and parameters suitable for searching a call records database and a call center configuration database. The record retrieval client **370** can further replay the records retrieved from the call records database such that a supervisor can review the activities of the selected agent, for example. During replay, the record retrieval client **370** can send the recorded on-screen activities to the display **390** for rendering, while replaying the voice data synchronously via a speaker (not shown) at the supervisor workstation **300**. Thus, the conversation between the agent and the contact can be heard while simultaneously viewing the on-screen activities of the agent. This can be particularly useful in providing feedback to the agent by providing critique from the supervisor, providing further training to correct noted mistakes, or for resolving disputes between the contact and the call center, among many others. It should be noted that the record retrieval client **370** could be provided to any of the agents as well. Moreover, it should also be noted that the record retrieval client **370** could be used to monitor data received directly from the agent workstation(s).

FIG. 4 shows a block diagram of a monitor server **400**. The monitor server **400** can include a processor **405**, I/O **410** and memory **415**. Each of these devices is coupled together by a bus **420**, which facilitates communications between the processor **405**, I/O **410** and memory **415**. The processor can be any commercially available processor. The I/O can include an interface for myriad hardware devices. For example, the I/O **410** can include an input interface such as, for example, a keyboard, a mouse, or some other suitable device, an output interface such as, for example, a monitor, a printer, or data communications interface, among others. The memory **415** of the system can include a RAM, ROM, a hard drive, or other suitable storage mechanisms. Also stored in memory **415** can be a number of applications, each of the applications being enabled for execution on the processor **405**. In the current example, the memory includes an operating system **430**, a monitor/retrieval server **435**, a statistics collection module **440**, and an analysis module **445**. It should also be understood that the memory can

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further include other applications (not shown). The monitor server **400** can include the call records database **450**, which can be located externally to the monitor server **400**, internally to the monitor server **400**, or a combination thereof. The call records database can be very large, and thus can be implemented in any mode that properly implements a designed storage capacity.

It should be understood that the monitor server **400** operates similarly to the monitor server described in U.S. patent application Ser. No. 11/166,630, entitled "Improved Method and Apparatus for Simultaneously Monitoring Computer User Screen and Telephone Activity from a Remote Location," in order to capture and record data from the agent workstation(s). However, the monitor server **400** additionally includes the functionality to collect information, video imagery, etc. on the agent(s) by recording the agent(s) and their activities in accordance with triggers determined by the statistics collection module **440**. The triggers enable the system to detect any patterns in the behavior of the agent(s).

The analysis module **445** can identify characteristics of an agent, or a group of agents. For example, facial recognition techniques may be applied to recognize an agent's identity. The analysis module **445** may also analyze and recognize objects in a field of view of the camera **224**. The analysis module **445** may be configured to determine if an area or location is the area or location purported by the agent.

It should be noted that the monitor/retrieval server **435** can use other triggers to decide whether to monitor or record an agent's workstation. For example, a scorecard is developed that helps a supervisor evaluate an agent based upon a variety of categories, including, for example, courteousness, skill, system knowledge, areas of expertise, etc. A supervisor or administrator can then set a threshold score, whereby agents meeting the threshold are not monitored, while agents not meeting the threshold are monitored. It should also be understood that the scorecard can be used to trigger monitoring when an agent with a low score in a particular area of expertise is handling calls in that same area of expertise, thereby enabling tighter monitoring of agents that may have trouble handling specific types of calls.

FIG. 5 shows an operational scenario for monitoring an agent terminal. At **500**, the process begins. At **502**, it is determined if a trigger condition exists. For example, the trigger condition may be at a beginning, end or during a conversation between the agent and a caller and can be set based upon business rules. The trigger condition may be initiated upon a call being placed by the agent or screen data being entered by the agent. The rules may include controlling the triggering of the capture of video/still pictures of agent or agent location such that the data is captured and recorded on specific events, time of day, on a percentage of events, or if capturing should be a video stream or still picture. At **502**, it is determined if image/video capture is required. Depending on the trigger, image/video capture may be performed based on requirements, such as legal compliance, human resource requirements, random sampling, etc.

At **506**, it is determined if a new capture is triggered or to mark an existing capture in-progress. Metadata indicative of the agent, the trigger condition, agent terminal, agent location, etc., may be added to the capture to note that a trigger occurred requiring the capture. At **508**, the image/video capture may be associated with other records. For example, records such as audio, screen capture, email, chat, etc., may be associated to the image/video capture using a common identifier.

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At **510**, it is determined if a stop condition exists, and if so, the capture of the image/video is stopped. For example, a conversation with a caller may have ended or a random sampling time ended, etc. At **512**, the captured image/video data may be recorded and augmented with metadata for later retrieval. At **514**, the process ends.

FIG. 6 shows another operational scenario for monitoring an agent terminal. The process begins at **600**. Operations **602-612** are similar to operations **502-512**, described above. At **614**, it is determined if analysis of the image/video is required. If so, then at **616**, the recorded image/video is retrieved for analysis by the analysis module. The analysis module **445** may determine characteristics of the captured image/video. At **618**, the results of the analysis at **616** may be associated with the image/video. As discussed below, the results may be used for many purposes to ensure compliance, quality, security, coaching, etc. At **620**, the process ends.

Thus, as described above, the implementations may be used to provide coaching of an agent. For example, during live monitoring, a supervisor can see an agent and/or a location during live monitoring of a call to see how the agent handles a situation and the environment they are in. The video/pictures may be jointly or separately displayed in near real-time with the monitoring of the agents communication or screen. For coaching purposes, the agent supervisor may be able to discuss the agent's performance/status. This may be performed as a video conference, and the implementations above may record the conference for human resource record keeping.

The implementations above also provide for security, such as a validation of identity of the agent. There is a concern that someone other than the agent may be handling calls or working on back office applications without company knowledge or consent. A single or multiple picture or video clip capture may be triggered at the beginning, end or during a conversation, or back office transaction and stored by the recording subsystem in the monitor server **145**. These are then associated with any other recording taken at the time such as the voice or screen recording. On replay, the face of the agent may be captured and their ID verified. The replaying of the video/still pictures may be time synchronized with the replay of the agent's voice or screen activities. In some implementations, the video or picture may be automatically analyzed (in near-real time or after recording) to validate the id of the agent.

The implementations above may be used to validate location security and/or conformance to company policies. There may be a concern that other people will be in the locality of the agent and be able to either monitor their calls or transactions, or just disrupt the quality of the working environment such as to reduce the quality of the agent's ability to work. In addition, other issues with the quality or safety of the location may also be brought into question. A single picture or video clip may be triggered at the beginning, end or during a conversation or back office transaction and stored by the recording system. This may be associated with other recording(s) taken at the time, such as the voice or screen recording. On replay, the location of the agent will be captured and the status of their location can be verified. In some implementations, the video or picture may be automatically analyzed in near real time or later to automatically indicate and violation of location rules or to indicate that other person was present.

The systems and methods data may be stored in one or more data stores. The data stores can be of many different types of storage devices and programming constructs, such

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as RAM, ROM, Flash memory, programming data structures, programming variables, etc. It is noted that data structures describe formats for use in organizing and storing data in databases, programs, memory, or other computer-readable media for use by a computer program.

The systems and methods may be provided on many different types of computer-readable media including computer storage mechanisms (e.g., CD-ROM, diskette, RAM, flash memory, computer hard drive, etc.) that contain instructions for use in execution by a processor to perform the methods' operations and implement the systems described herein.

The computer components, software modules, functions and data structures described herein may be connected directly or indirectly to each other in order to allow the flow of data needed for their operations. It is also noted that a module or processor includes but is not limited to a unit of code that performs a software operation, and can be implemented for example as a subroutine unit of code, or as a software function unit of code, or as an object (as in an object-oriented paradigm), or as an applet, or in a computer script language, or as another type of computer code.

While this disclosure has been made with specific detail with reference to the present disclosure it should be understood that many variations and modifications may be effected without departing from the scope of the disclosure as described in the appended claims.

What is claimed is:

1. A method for monitoring a remote agent, comprising:
 - receiving, at a monitoring server, data poll updates from a remote agent workstation subject to a series of data polls, the data poll updates including workstation data corresponding to changed regions of a screen display detected between the data polls;
 - identifying, at the monitoring server, a trigger condition from the data poll updates and
 - upon identifying by the monitoring server that the trigger condition exists:
 - controlling, with the monitoring server, data recording of telephone and on-screen computer activities associated with the agent at a remote location;
 - capturing video imagery from the remote agent workstation, wherein the capturing of video imagery is controlled by the monitoring server while the video imagery is transmitted as a continuous data stream from the camera to the monitoring server;
 - configuring the data recording and the video imagery capturing as passive processes not visible to the end user; and
 - storing call records in a call records database, the call records comprising the telephone and on-screen computer activities, video imagery and metadata that includes any trigger condition that was identified for a respective call record;
 - configuring a statistics collection module on the monitor server to search the call records to detect patterns of behavior from multiple call records and multiple instances of triggers in the call records; and
 - using the statistics collection module to determine additional triggers from the patterns of behavior for use by the monitoring server.
2. A method according to claim 1, further comprising capturing video imagery of an environment in which the remote workstation is located.

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3. A method according to claim 1, further comprising:
 storing in the call records database video of an agent at the
 remote agent workstation and the telephone and on-
 screen recordings and
 determining whether the agent's activities are inconsistent
 with predetermined parameters associated with remote
 agent activities by at least reviewing selected contents
 of the call records database.

4. A method according to claim 1, further comprising
 initiating the data recording upon screen data being entered
 by a remote agent into the remote agent workstation during
 an ongoing conversation between the remote agent and a
 caller.

5. A method according to claim 1, further comprising
 configuring the remote agent work station to send the data
 poll updates to the monitoring server without prompting by
 the monitoring server.

6. A method according to claim 1, further comprising
 receiving the polling updates at the monitoring server from
 the remote agent workstation after the remote agent work-
 station intercepts workstation data by hooking.

7. A method according to claim 1, further comprising
 receiving the polling updates at the monitoring server from
 the remote agent workstation after the remote agent work-
 station intercepts workstation data by scraping.

8. A method according to claim 1, further comprising
 receiving the polling updates from the remote agent work-
 station after the remote agent workstation intercepts work-
 station data in the form of graphics primitives.

9. A method for monitoring a remote agent, comprising:
 generating graphics primitive commands with a plurality
 of respective applications operating on a remote agent
 workstation;
 subjecting the remote agent workstation to a series of data
 polls from a monitoring server;
 identifying, with the remote agent workstation, current
 data poll updates for the respective applications by
 comparing graphics primitive commands generated for
 the respective applications;
 receiving, at the monitoring server, at least one data poll
 update from at least one of the applications running on
 the remote agent workstation, the data poll updates
 including workstation data corresponding to changed
 regions of a screen display detected among the respec-
 tive primitive graphics commands between the data
 polls at the workstation;
 storing the at least one data poll update in call records in
 a call records database accessible by the monitoring
 server;
 determining, at the monitoring server, at least one trigger
 condition from historical data poll updates stored in a
 plurality of call records and
 upon identifying by the monitoring server that the trigger
 condition exists in the current data poll updates:
 controlling, with the monitoring server, data recording
 of telephone and on-screen computer activities asso-
 ciated with the remote agent workstation; and
 capturing, during the data recording, video imagery of
 an agent at the remote agent workstation, wherein
 the capturing is controlled by the monitoring server;
 configuring the data recording and the video imagery
 capturing as passive processes not visible to the end
 user;
 adding metadata to the information gathered from the
 data recording and the capturing and

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storing the telephone and on-screen computer activities
 and video imagery and metadata in the call records
 database accessible by a monitoring workstation.

10. A method according to claim 9, further comprising
 capturing video imagery of an environment in which the
 remote workstation is located.

11. A method according to claim 9, further comprising:
 storing the video imagery and the telephone and on-screen
 recordings, in the database, and
 determining whether the agent's activities are inconsistent
 with predetermined parameters associated with remote
 agent activities by at least reviewing selected contents
 of the database.

12. A method according to claim 9, further comprising
 sending data poll updates to the monitoring server without
 prompting by the monitoring server.

13. A method according to claim 9, further comprising
 receiving the polling updates from the remote agent work-
 station after the remote agent workstation intercepts work-
 station data by hooking.

14. A method according to claim 9, further comprising
 receiving the polling updates from the remote agent work-
 station after the remote agent workstation intercepts work-
 station data by scraping.

15. A system, comprising:
 a monitoring server comprising a processor and a memory
 coupled to the processor, the memory storing a set of
 trigger condition data;
 a remote agent workstation comprising a graphics engine
 and respective applications operating thereon and in
 data communication with the monitoring server,
 wherein the monitoring server and the remote agent
 workstation are configured with respective computer
 implemented instructions to perform a method com-
 prising the steps of:
 receiving, at the monitoring server, data poll updates from
 a remote agent workstation subject to a series of data
 polls, the data poll updates corresponding to changes in
 workstation data detected between the data polls at the
 remote agent workstation;
 storing call records in a call records database, the call
 records comprising the changes in workstation data
 detected between the data polls at the remote agent
 workstation and metadata identified for a respective
 call record;
 configuring a statistics collection module on the monitor
 server to search the call records to detect patterns of
 behavior from multiple call records; and
 using the statistics collection module to determine addi-
 tional trigger conditions from the patterns of behavior,
 for use by the monitoring server,
 identifying, at the monitoring server, the presence of at
 least one of the trigger conditions from the data poll
 updates, and upon identifying by the monitoring server
 that the trigger condition exists:
 controlling, with the monitoring server, data recording of
 telephone and on-screen computer activities associated
 with the remote agent workstation;
 capturing video imagery from the remote agent worksta-
 tion, wherein the capturing of video imagery is con-
 trolled by the monitoring server while the video imag-
 ery is transmitted as a continuous data stream from the
 camera to the monitoring server;
 configuring the remote agent workstation to identify the
 data recording and the video imagery capturing as
 passive processes not visible to the end user;

adding metadata including the identified trigger condition to the information gathered from the data recording and the capturing and

storing the telephone and on-screen computer activities and video imagery and the metadata in the call records database such that storing the identified trigger condition makes the identified trigger condition available to determine additional trigger conditions and additional patterns of behavior.

16. A system according to claim 15, further comprising an agent processor and agent memory configured to compile the data poll updates by comparing graphics primitive commands generated by respective applications running at the remote agent workstation.

17. A system according to claim 15, wherein detecting changes in the graphics primitive commands comprises detecting automatic screen changes produced by at least one of the respective applications.

18. A system according to claim 15, further comprising synchronizing the data recording of telephone data, on-screen computer activities, and video imagery.

19. A system according to claim 15, further comprising a monitoring workstation in data communication with the monitoring server and the remote agent workstation, wherein the monitoring workstation is configured to replay a selection from the call records database.

20. A system according to claim 15, wherein the monitoring server further comprises computer implemented instructions configured to identify the presence of a trigger condition during a previously triggered data recording of workstation data.

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